

Agricultural Chemical Usage

Michigan statistics for on-farm use of agricultural chemicals are from the 2009 Fruit Chemical Use Survey conducted by USDA, NASS for 23 fruit crops in twelve states. Chemical use statistics for other states and pest management practices are available online at: www.nass.gov/Statistics_by_Subject/Environmental/

The fertilizer use statistics for wheat in Michigan are from the 2009 Agricultural Resource Management Survey. Other information on fertilizer and chemical use on wheat are also available on the NASS website.

Apples: Agricultural chemical applications, 2009¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
Herbicides					
2,4-D, dimeth. salt	19	1.4	0.734	1.001	7,400
Diuron	9	1.5	1.077	1.592	5,300
Glyphosate iso. salt	41	1.3	0.782	1.016	15,800
Paraquat	4	1.3	0.588	0.736	1,100
Pendimethalin	9	1	1.434	1.45	4,900
Rimsulfuron	1	1	0.029	0.029	(²)
Simazine	2	1	1.297	1.297	1,000
Terbacil	3	1	0.484	0.498	600
Insecticides					
Abamectin	21	1.1	0.01	0.011	100
Acetamiprid	15	1.5	0.122	0.178	1,000
Azinphos-methyl	70	2.2	0.665	1.461	38,800
Benzoic acid	2	1.3	0.23	0.297	300
Carbaryl	35	1.3	0.933	1.258	16,700
Chlorantraniliprole	45	1.9	0.064	0.123	2,100
Chlorpyrifos	69	1.4	0.997	1.434	37,700
Clofentezine	2	1	0.116	0.116	100
Cyfluthrin	8	1.1	0.032	0.035	100
Emamectin benzoate	6	1.1	0.013	0.014	(²)
Endosulfan	3	1.3	1.191	1.513	1,600
Esfenvalerate	43	1.3	0.038	0.05	800
Etoxazole	3	1.3	0.13	0.165	200
Fenpropathrin	10	1.2	0.303	0.359	1,400
Fenpyroximate	9	1	0.091	0.092	300
Gamma-cyhalothrin	2	1.6	0.015	0.023	(²)
Imidacloprid	40	1.4	0.061	0.083	1,300
Lambda-cyhalothrin	4	1.5	0.026	0.037	100
Methomyl	14	1.4	0.723	1.046	5,500
Novaluron	17	1.4	0.116	0.165	1,100
Petroleum distillate	8	1.2	15.894	19.155	57,700
Petroleum oil	7	1.1	5.023	5.543	15,400
Phosmet	38	2.1	1.369	2.821	41,200
Pyridaben	8	1.2	0.262	0.319	1,000
Spinetoram	37	1.6	0.08	0.125	1,700
Thiacloprid	19	1.3	0.153	0.206	1,500
Thiamethoxam	3	1.3	0.077	0.104	100

See footnote(s) at end of table.

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Apples: Agricultural chemical applications, 2009¹ (continued)

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
Fungicides					
Basic copper sulfate	20	1.4	0.598	0.823	6,100
Boscalid	1	1.3	0.009	0.011	(²)
Calcium polysulfide	2	2.2	4.103	9.114	5,700
Captan	84	6.1	2.201	13.36	426,400
Copper hydroxide	23	1.3	1.486	1.886	16,500
Copper oxychloride	18	1.4	1.826	2.553	17,700
Copper sulfate	4	1.1	1.023	1.113	1,900
Cyprodinil	29	1.8	0.154	0.272	3,000
Difenoconazole	34	1.8	0.068	0.123	1,600
Dodine	5	1.6	1.252	1.953	3,900
Fenarimol	5	3.4	0.047	0.16	300
Fenbuconazole	23	1.9	0.095	0.18	1,600
Kresoxim-methyl	20	2	0.12	0.241	1,800
Mancozeb	74	4.1	2.719	11.139	312,900
Metiram	13	3.4	2.754	9.25	44,300
Myclobutanil	38	2.2	0.095	0.208	3,000
Oxytetracycline	10	1.5	0.183	0.279	1,100
Pyraclostrobin	1	1.3		0.001	(²)
Pyrimethanil	8	1.4	0.246	0.352	1,100
Streptomycin	26	1.7	0.19	0.327	3,200
Streptomycin sulfate	3	1	0.214	0.216	200
Sulfur	20	3.8	3.101	11.67	89,200
Thiophanate-methyl	20	1.9	0.325	0.62	4,600
Trifloxystrobin	40	1.9	0.063	0.117	1,800
Ziram	32	1.9	3.168	6.065	74,200
Other chemicals					
Benzyladenine	11	1.1	0.059	0.062	300
Butenoic Acid Hydro	4	1.1	0.071	0.079	100
Dodecadien-1-OL	3	1.6	0.029	0.046	100
Gibberellic acid	5	2	0.005	0.01	(²)
Gibberellins A4A7	2	1	0.026	0.026	(²)
NAA, Potassium salt	4	1.6	0.07	0.111	200
NAA, Sodium	17	1.5	0.023	0.036	200
Prohexadione calcium	19	1.8	0.184	0.335	2,400
Spirodiclofen	24	1.1	0.206	0.235	2,100

¹ Bearing acres in 2009 were 38,000 acres.

² Total applied is less than 50 lbs.

Blueberries: Agricultural chemical applications, 2009¹

Agricultural Chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
Herbicides					
Diuron	19	1	1.397	1.429	5,000
Flumioxazin	2	1	0.144	0.144	100
Glyphosate iso. salt	13	1.2	0.542	0.629	1,500
Hexazinone	2	1.1	0.413	0.448	200
Mesotrione	22	1.1	0.121	0.129	500
Norflurazon	11	1.1	1.362	1.431	3,000
Oryzalin	2	1	1.279	1.279	400
Paraquat	7	1	0.405	0.42	600
Sethoxydim	1	1	0.262	0.262	100
Simazine	10	1.2	1.45	1.678	3,000
Terbacil	19	1.1	0.507	0.546	1,900
Insecticides					
Acetamiprid	11	1.9	0.098	0.19	400
Azinphos-methyl	34	1.3	0.532	0.704	4,400
Benzoic Acid	34	1.2	0.164	0.198	1,200
Carbaryl	13	1.7	1.458	2.481	6,100
Esfenvalerate	33	1.3	0.042	0.056	300
Imidacloprid	17	1.4	0.069	0.1	300
Malathion	19	1.9	1.943	3.64	12,600
Methomyl	16	1.4	0.513	0.74	2,200
Phosmet	69	2.1	0.877	1.835	23,400
Tebufenozide	8	1.4	0.228	0.318	500
Zeta-Cypermethrin	45	1.5	0.033	0.049	400
Fungicides					
Azoxystrobin	8	1.1	0.157	0.177	300
Boscalid	45	1.4	0.019	0.028	200
Calcium polysulfide	19	1.1	2.461	2.608	9,000
Captan	30	2	2.095	4.265	23,800
Chlorothalonil	16	1.4	2.574	3.516	10,500
Cyprodinil	11	1.2	0.293	0.353	700
Fenbuconazole	85	2.1	0.09	0.19	3,000
Fludioxonil	11	1.2	0.195	0.235	500
Fosetyl-al	9	1.1	3.99	4.322	7,100
Phosphorous Acid	6	1.1	1.741	1.92	2,100
Pyraclostrobin	71	1.9	0.091	0.176	2,300
Ziram	56	1.7	2.774	4.757	48,900

¹ Bearing acres in 2009 for Michigan were 18,500 acres.

Cherries, sweet: Agricultural chemical applications, 2009¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
Herbicides					
2,4-D, dimeth. salt	12	1.3	0.561	0.756	600
Glyphosate iso. salt	34	1.2	0.679	0.814	1,900
Paraquat	3	1.2	0.825	1.008	200
Pendimethalin	2	1	0.733	0.733	100
Rimsulfuron	1	1	0.013	0.013	(²)
Simazine	3	1	0.863	0.863	200
Insecticides					
Azinphos-methyl	60	1.9	0.508	0.962	4,100
Chlorpyrifos	3	1.1	0.89	0.96	200
Cyfluthrin	5	1	0.024	0.024	(²)
Esfenvalerate	42	1.5	0.036	0.052	200
Fenpropathrin	3	1	0.197	0.197	(²)
Imidacloprid	10	1.4	0.094	0.13	100
Lambda-Cyhalothrin	5	1.6	0.028	0.044	(²)
Phosmet	3	3	1.131	3.398	800
Thiamethoxam	27	1.3	0.06	0.081	200
Fungicides					
Boscalid	42	1.5	0.009	0.014	(²)
Calcium polysulfide	16	2.3	4.192	9.442	10,400
Captan	41	1.9	1.873	3.572	10,200
Chlorothalonil	62	2.1	1.789	3.835	16,600
Copper hydroxide	4	1	0.863	0.898	300
Copper oxychloride	4	1.2	1.88	2.22	700
Copper sulfate	3	1.2	0.515	0.622	100
Fenbuconazole	71	2.3	0.091	0.213	1,100
Myclobutanil	3	1.5	0.12	0.18	(²)
Propiconazole	10	1	0.123	0.128	100
Pyraclostrobin	42	1.5		0.001	(²)
Sulfur	69	4	4.026	16.034	77,600
Tebuconazole	36	2	0.168	0.339	800
Thiophanate-methyl	8	1.2	0.919	1.129	600
Trifloxystrobin	19	1.8	0.051	0.09	100
Ziram	40	1.6	2.353	3.812	10,600
Other chemicals					
Ethephon	71	1.1	0.418	0.454	2,300
Spirodiclofen	4	1.2	0.149	0.178	100

¹ Bearing acres in 2009 for Michigan were 7,000 acres.

² Total applied is less than 50 lbs.

Cherries, tart: Agricultural chemical applications, 2009¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
Herbicides					
Glyphosate iso. salt	33	1.2	0.588	0.676	5,900
Paraquat	4	1.3	0.884	1.14	1,000
Rimsulfuron	1	1	0.018	0.018	(²)
Simazine	6	1.1	0.948	1.033	1,700
Insecticides					
Azinphos-methyl	61	2.2	0.404	0.895	14,300
Carbaryl	2	1.3	2.374	3.145	1,900
Chlorpyrifos	26	1.3	0.756	1.014	6,800
Esfenvalerate	31	1.4	0.03	0.041	300
Gamma-cyhalothrin	2	1	0.01	0.01	(²)
Imidacloprid	4	1.8	0.077	0.136	200
Kaolin	1	5.8	19.711	113.507	20,200
Lambda-cyhalothrin	4	1.5	0.018	0.026	(²)
Phosmet	63	1.8	0.98	1.717	28,100
Thiamethoxam	3	1.3	0.048	0.061	100
Fungicides					
Boscalid	46	1.9	0.008	0.015	200
Calcium polysulfide	6	1.7	1.659	2.739	4,600
Captan	42	2.1	1.393	2.972	32,300
Chlorothalonil	74	3.3	1.636	5.373	103,200
Copper hydroxide	3	1.7	1.194	1.974	1,700
Copper sulfate	2	1	0.948	0.97	600
Cyprodinil	2	1	0.158	0.158	100
Fenbuconazole	31	1.9	0.08	0.155	1,300
Iprodione	2	1.4	0.635	0.861	500
Pyraclostrobin	46	1.9	(³)	0.001	(²)
Sulfur	68	4.2	2.755	11.654	207,300
Trifloxystrobin	52	1.9	0.053	0.098	1,300
Ziram	2	1.2	2.561	3.101	1,400
Other chemicals					
Etephon	76	1.2	0.208	0.25	4,900
Spirodiclofen	5	1.1	0.167	0.19	200

¹ Bearing acres in 2009 for Michigan were 26,000 acres.

² Total applied is less than 50 lbs.

³ Rate per acre is less than 0.0005 lbs.

Peaches: Agricultural chemical applications, 2009¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
Herbicides					
2,4-D, dimeth. salt	6	1	0.599	0.608	200
Diuron	5	1	1.369	1.369	300
Glyphosate iso. salt	16	1.2	0.73	0.871	600
Paraquat	19	1.1	0.462	0.523	400
Pendimethalin	7	1	1.255	1.274	400
Rimsulfuron	2	1	0.021	0.021	(²)
Simazine	5	1	0.739	0.739	200
Terbacil	7	1	0.407	0.407	100
Insecticides					
Azinphos-methyl	2	2.8	0.767	2.169	200
Carbaryl	16	1.5	1.299	1.937	1,300
Chlorpyrifos	15	1.3	1.285	1.677	1,100
Cyfluthrin	39	1.7	0.035	0.061	100
Endosulfan	5	1.2	0.837	0.99	200
Esfenvalerate	49	2.7	0.036	0.096	200
Fenpropathrin	7	1.5	0.258	0.396	100
Gamma-Cyhalothrin	15	2	0.016	0.031	(²)
Imidacloprid	56	1.6	0.07	0.112	300
Lambda-cyhalothrin	22	2.1	0.025	0.052	(²)
Methomyl	13	1.7	0.588	1.017	500
Permethrin	10	2.3	0.179	0.409	200
Phosmet	54	2.9	1.242	3.546	8,300
Spinetoram	6	1.1	0.081	0.089	(²)
Thiamethoxam	11	1.1	0.057	0.066	(²)
Fungicides					
Basic copper sulfate	18	1.2	1.183	1.446	1,100
Boscalid	7	1.9	0.009	0.018	(²)
Captan	40	3.8	1.524	5.819	10,000
Chlorothalonil	15	1.8	2.275	4.001	2,600
Copper hydroxide	14	1.7	1.295	2.205	1,300
Copper oxychloride	17	1.2	2.966	3.537	2,500
Dodine	16	3	0.325	0.99	700
Fenbuconazole	66	3.1	0.08	0.245	700
Iprodione	4	1	0.634	0.634	100
Myclobutanil	33	2.3	0.077	0.173	200
Oxytetracycline	19	3.5	0.228	0.797	700
Propiconazole	21	2.2	0.105	0.235	200
Pyraclostrobin	7	1.9		0.001	(²)
Sulfur	58	4.4	6.122	27.056	67,500
Tebuconazole	20	1.7	0.119	0.207	200
Thiophanate-methyl	6	2.4	0.448	1.077	300
Ziram	10	1.2	2.888	3.46	1,500
Other chemicals					
Spirodiclofen	3	1	0.254	0.256	(²)

¹ Bearing acres in 2009 for Michigan were 4,300 acres.

² Total applied is less than 50 lbs.

Fertilizer applications: Winter wheat, 2009¹

Fertilizer	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 pounds
Nitrogen	96	1.8	46	82	48,000
Phosphate	58	1	48	48	17,000
Potash	67	1.1	66	76	31,000

¹ Planted acres in 2009 were 620,000.

Commercial fertilizer consumption: 2004-2008¹

Item	Year ending June 30				
	2004	2005	2006	2007	2008
Short tons	Short tons	Short tons	Short tons	Short tons	Short tons
Primary plant nutrients					
Total N	264,850	253,433	232,710	268,566	241,823
N in multi-nutrients	60,405	57,559	58,308	53,231	44,373
Total P ₂ O ₅	94,352	82,885	85,746	81,110	74,767
P ₂ O ₅ in multi-nutrients	92,225	81,187	83,841	80,132	74,219
Total K ₂ O	210,479	189,432	163,523	184,571	173,104
K ₂ O in multi-nutrients	46,989	41,926	36,883	28,060	24,902
Total plant nutrients	569,680	525,751	481,979	534,247	489,694
Average analysis	41.1	37.7	41.3	41.1	40.8
Total nutrients in multi-nutrients	199,620	180,673	179,031	161,423	143,494
Selected single-nutrient materials					
Ammonium nitrate	6,619	7,501	5,168	2,899	3,085
Anhydrous ammonia	43,551	50,071	33,759	45,245	38,983
Nitrogen solutions	323,712	301,868	279,293	367,967	302,401
Urea	132,493	108,090	107,941	118,448	137,423
Ammonium sulfate	30,376	36,660	30,254	44,904	35,860
Concentrated superphosphate	4,139	3,716	4,189	1,866	945
Potassium chloride	259,011	234,700	203,398	250,800	235,815
Multiple-nutrient fertilizers					
N-P-K	294,691	227,081	245,713	205,901	198,596
N-P	142,136	134,719	143,185	147,526	131,150
N-K	33,024	44,437	56,456	59,737	60,093
P-K	3,129	2,926	2,536	1,934	592
Leading multiple-nutrient grades					
10-34-0	50,860	37,026	47,687	52,204	44,409
11-52-0	34,428	35,776	35,295	35,713	42,688
18-46-0	35,938	38,902	39,534	39,568	25,550
6-24-6	2,623	(²)	(²)	(²)	15,867
28-0-3	(²)	(²)	(²)	4,680	7,774
Fertilizer consumption by classes					
Dry bulk single-nutrient	472,774	430,495	380,147	442,432	429,052
Dry bagged single-nutrient	35,943	19,815	18,688	21,017	20,665
Fluid single-nutrient	373,002	362,722	319,143	422,173	358,642
Dry bulk multiple-nutrient	248,576	202,878	214,164	156,861	134,348
Dry bagged multiple-nutrient	150,598	137,291	145,636	160,428	155,401
Fluid multiple-nutrient	73,805	68,993	88,090	97,809	100,681
Organics, secondary and micronutrients	60,845	58,519	148,112	134,015	150,999
Total	1,415,544	1,280,715	1,313,980	1,434,734	1,349,788

¹ Source: The Association of American Plant Food Control Officials.

² Grade not published.